

## ***Aspergillus ochraceus* 11 alpha-hydroxylase and oxidoreductase**

### ***Abstract***

5       The present invention relates to a novel cytochrome P450-like enzyme  
(*Aspergillus ochraceus* 11 alpha hydroxylase) and an oxidoreductase (*Aspergillus*  
*ochraceus* oxidoreductase) isolated from cDNA library generated from the mRNA of  
*Aspergillus ochraceus* spores. When the cDNA encoding the 11 alpha hydroxylase  
was co-expressed in *Spodoptera frugiperda* (Sf-9) insect cells with the cDNA  
10       encoding human oxidoreductase as an electron donor, it successfully catalyzed the  
conversion of the steroid substrate 4-androstene-3,17-dione (AD) to 11 alpha-  
hydroxy-AD as determined by HPLC analysis. The invention also relates to nucleic  
acid molecules associated with or derived from these cDNAs including  
complements, homologues and fragments thereof, and methods of using these  
15       nucleic acid molecules, to generate, for example, polypeptides and fragments  
thereof. The invention also relates to the generation of antibodies that recognizes  
the *A. ochraceus* 11 alpha hydroxylase and oxidoreductase and methods of using  
these antibodies to detect the presence of these native and recombinant  
polypeptides within unmodified and transformed host cells, respectively. The  
invention also provides methods of expressing the *Aspergillus* 11 alpha  
20       hydroxylase gene separately, or in combination with human or *Aspergillus*  
oxidoreductase, in heterologous host cells, to facilitate the bioconversion of steroid  
substrates to their 11 alpha hydroxy-counterparts.